BrightStor™ CA-Allocate™ DASD Space and Placement

Getting Started

Computer Associates™

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Contents

Chapter 1

Welcome

This book is designed to introduce BrightStor CA-Allocate DASD Space and Placement to you, in an efficient and visual manner. By the time you have finished reading this guide, you will have an overview of the wide scope of the product and its usability will be familiar to you. It is important to us that you feel comfortable with this product before you begin to use it.

BrightStor CA-Allocate

BrightStor CA-Allocate is a powerful and flexible allocation management system that allows the Storage Administrator to control the allocation of all MVS data sets. It gets control for all requests for new disk space from both batch and online functions. Decisions can be made to either enforce standards or to allow selected jobs or users to bypass them. It allows for centrally controlled DASD and tape space allocations, brings a new level of control to DFSMS allocation functions, and resolves *x*-37 abends and other out-of-space conditions.

Benefits

Benefits for using BrightStor CA-Allocate are:

- Avoid application failures.
- Centralize allocation control for all MVS data.
- Enforce efficient space allocation standards.
- Reduce DASD and tape budgets.
- Correct space usage problems with high/low watermark reporting.
- Extend the benefits of Tape Mount Management to the entire storage environment.

In addition, BrightStor CA-Allocate performs several important functions:

- Enables you to use the system to enforce installation standards.
- Enables you to establish DASD space limits for individuals or groups of users. The system automatically monitors the limits and optionally enforces them.
- Simplifies the task of allocating data sets for end users.

Depending on the application, the Storage Administrator can determine the appropriate level of enforcement. This might be to simply issue a warning message and allow the allocation to continue, or possibly to cancel the allocation whenever a violation takes place. This product can be configured to correct the violation automatically whenever it can and to continue with the allocation process. It is entirely up to the Storage Administrator to decide just how much control the product is to have.

Without BrightStor CA-Allocate, the data center must rely on its users to put their data sets on the right volumes. As more and more volumes are brought online, data set placement becomes unmanageable. Volume pooling simplifies this process by reducing the number of items that need to be managed. Instead of managing 1,000 volumes, the Storage Administrator can choose to manage 10 pools or, in BrightStor CA-Allocate terms, storage groups.

From a Storage Administrator's point of view, BrightStor CA-Allocate is the tool needed to enforce the standards and DASD space limits that users too often "forget." It can enforce standards and DASD space limits automatically, freeing the Storage Administrator from having to correct violations after the fact.

Controlling Your Allocation of MVS Data Sets

BrightStor CA-Allocate is a system that allows your Storage Administrator to control allocation of MVS data sets. It gets control for all requests for new disk space from both batch and online functions. Decisions can be made to either enforce standards or to allow selected jobs or users to bypass them.

At a glance, the system:

- Provides a central point of control to manage the allocation of all data sets, including those managed by DFSMS.
- Enforces allocation standards automatically and simplifies the administration of allocation rules.
- Allows administrators to modify allocations dynamically to meet organizational standards.
- Frees users from concerns over physical device characteristics.
- Provides dynamic management of storage group definitions.
- Reduces abends due to allocation errors or space constraints.
- Improves system throughput dramatically.
- Provides automatic redirection between tape and DASD.

BrightStor CA-Allocate provides a central point of control to manage the allocation of all data sets, including those managed by IBM's Data Facility Storage Management Subsystem (DFSMS). It can determine whether or not a new allocation is to be DFSMS-managed, provide DFSMS-like control to non-DFSMS data sets, or individually change many data set attributes.

It automatically enforces allocation standards and directs data sets to the correct tape or volume pool, resulting in more efficient tape and DASD use. The rules are defined by the storage administrator in the Allocation Selection Routine (ASR). When modifications are required, changes can be easily implemented. A single command will refresh the system with new rules and dynamically update the allocation criteria with no downtime required.

With BrightStor CA-Allocate, system throughput is improved. It intercepts secondary allocation abends due to lack of space on a specified volume, then adds an additional volume to allow processing to continue uninterrupted.

For new allocations, it can automatically substitute a value consistent with user-defined standards when a unit, volume, space request, blocksize, catalog disposition or expiration date is incorrectly specified. Utilizing this substitution capability, it can redirect allocations, for example, from tape to DASD or from DASD to tape.

It can interface with security systems, such as eTrust CA-ACF2, eTrust CA-TOP SECRET, and IBM's RACF, to access user- and group ID-related information. It can also verify allocation authorization before performing allocation tasks.

The optional Quota Component controls DASD space usage at a group or user level. Using group definitions specified by the storage administrator, the Quota Component monitors the total DASD space allocated. It can issue a warning or prohibit a new allocation or secondary extension when predefined maximum space allocation thresholds for the group are exceeded.

The optional Allocation Control Component of BrightStor CA-Vantage Storage Resource Manager provides an easy-to-use PC GUI for editing and compiling BrightStor CA-Allocate's ASRs in a graphical environment.

The BrightStor CA-Allocate Documentation Set

The documentation set has been engineered to take advantage of the latest technology for online viewing, keyword searching, book marking, and printing. This set contains a hardcopy of the *Getting Started*, the set also contains the *Getting Started,* the *User Guide* and the *Messages Guide* in Adobe Acrobat Reader format on the CD.

- The *Getting Started*

  The Getting Started guide is new with this release and provides the user with an introduction to the product.

- The *User Guide*

  This guide contains detailed installation steps and how to use and troubleshoot BrightStor CA-Allocate and its Components.

- The *Messages Guide*

  This guide is an alphanumeric listing of the messages produced by BrightStor CA-Allocate and its Components. This guide advises you what prompted BrightStor CA-Allocate to give a message and the action you can take.

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For More Information

After walking through this Getting Started guide, you can refer to the numerous resources available to you for additional information. In addition, the online help system at esupport.ca.com offers procedural information and answers to any questions you may encounter.

Chapter 2

Basic Concepts

System Overview

BrightStor CA-Allocate is a system utility that allows the Storage Administrator to control the allocation of MVS data sets. It gets control for all requests for new disk space from both batch and online functions. Decisions can be made to either enforce standards or to allow selected jobs or users to bypass them.

As a system utility program for the MVS operating system, it controls how storage space is allocated. It intercepts requests for storage space and executes an Allocation Selection Routine (ASR) that is written in a CLIST-like language. It also provides many built-in variables, such as DSN and USER, on which the Storage Administrator can base decisions for controlling allocations.

BrightStor CA-Allocate resides in the operating system and is initiated by a Started Task. The Started Task dynamically reconfigures options through the operator's console. If the optional Quota Component is not being used, the Started Task can be instructed to terminate immediately after installation. The system can easily be removed by an operator command to the Started Task.

BrightStor CA-Allocate provides direct interfaces to the ACF2, Top Secret, and RACF security systems. It interfaces with the installed security system to determine user IDs and to make sure that allocations for certain data sets are allowed onto certain volumes.

BrightStor CA-Allocate can also be used to enforce an installation's naming standards. This can be done by either defining what names (or name patterns) are allowed or, optionally, which users are authorized to use each data set name.

BrightStor CA-Allocate can control the assignment of retention periods and expiration dates during the allocation process, enabling the Storage Administrator to set minimum, maximum, and default retention periods at the data set, pool, or system-wide level.

The optional Quota Component provides can track if data set usage by groups rather than by individual users. It can define groups explicitly or, if using its RACF security interface, it can obtain the group ID the user is associated within RACF. This use of groups minimizes the repetition of user IDs when defining installation options.

The ASR can call up to ten User Exits at any point in the routine. If special requirements exist at an installation, these exits can be coded to further tailor BrightStor CA-Allocate. It is, however, designed with maximum flexibility as its goal. Most installations are able to use the product to provide the needed functions without having to code any special routines of their own.

BrightStor CA-Allocate provides features that can dynamically enforce standards and DASD quota limits and provide pooling capabilities for better DASD utilization. With this product, the storage administrator can:

- Change the unit name.
- Optimize block size.
- Enforce cataloging action.
- Ignore or change volser parameters.
- Enforce data set naming standards.
- Execute an assembler language user exit.
- Add or remove the RLSE or CONTIG JCL parameters.
- Restrict VSAM data sets to certain catalogs.
- Prevent the allocation of non-conforming data sets.
- Add, remove, or change a retention period or expiration date.
- Provide dynamic storage group reconfiguration without an IPL.
- Change both the primary and secondary amount of space requested.
- Define which volumes are contained in each storage group (pool).
- Send a tailored message to the user making the allocation request.
- Check authority to create a data set on a volume via the security system.
- Provide an option to maintain volume or storage group free-space thresholds.
- Eliminate concern about mount attributes because volumes can be mounted with any attribute.
- Establish, maintain, and enforce disk space limits using the Quota selectable unit.
- Add, remove, or change the SMS constructs: DATACLAS, STORCLAS, MGMTCLAS, and STORGRP.
- For VSAM allocations, ignore JOBCAT and STEPCAT DD statements or a catalog name specified on the define.
- Allocate the DATA component and INDEX component of a VSAM cluster on separate volumes for better performance.
- Prevent B37- and E37-type abends by dynamically adding volumes to output data sets.

Product Overview

BrightStor CA-Allocate runs on all levels of OS/390 and z/OS. It requires approximately 60KB below and 700 KB above the 16 MB line. Although designed to run in a JES2 Environment, it can run in JES3 as well. An APF-authorized library is required.

This product is not just one of many OEM applications available today, it's actually another layer of the Operating System. The operating system interface consist of SVC hooks, module intercept points, and installation exit points. User configuration files include the Allocation Selection Routine (ASR), non-SMS Storage Group Table, and, for the optional Quota Component, the Disk and CSA Quota Tables and the Quota Configuration File.

Operating System Interfaces

With two exceptions, these are for the most part installed using the LIFO (Last In, First Out) methodology. The IGGPRE00 and IGGPOST0 installation Exit Routines can be installed using either the LIFO or STUB methodology. The operating system interfaces are not modifiable via the REFRESH command. This means that after any PTFs are applied containing OBJ code updates, BrightStor CA-Allocate will need to be first shut down, then restarted, in order for it to start running with the changes.

Allocation Selection Routine (ASR)

This CLIST-like language is used by the Storage Administrator to determine what BrightStor CA-Allocate will do to the allocation requests it intercepts. Over 300 variables, more than half of which are modifiable, are capable of providing minute granularity.

The online copy of the ASR resides as member of the partitioned data set referenced in the PARMS DD statement in the JCL used to install the product into the operating system. The executable copy of it is compiled and loaded into real memory above the 16MB line. The ASR is modifiable via the REFRESH command. This means that changes can be made to the ASR dynamically, without the need to remove/reinstall the operating system interfaces.

Buddy Tip—*ASR stands for Allocation Selection Routine. It allows Storage Administrators to write simple logic statements that define and enforce their installation's standards for data set allocations and disk space quota limits. The ASR employs a CLIST-like language that gives great flexibility and simplicity in defining how BrightStor CA-Allocate operates. This CLIST-like language allows a simple "program" with IF-THEN-ELSE logic statements to be created. The approach makes obsolete the old-style macros and fixed-field control statement method of specifying options to a software package.*

Storage Group Table

BrightStor CA-Allocate storage groups logically manage non-SMS-managed volumes. DFSMS storage groups manage SMS-Managed volumes. BrightStor CA-Allocate can redirect allocations to either its own storage groups, or those belonging to DFSMS.

The online copy of its storage group table resides as a member of the partitioned data set referenced in the PARMS DD statement in the JCL used to install the product into the operating system. The executable copy of it is compiled and loaded into real memory above the 16MB line. The storage group table is modifiable via the REFRESH command.

CSA Quota Table

The CSA Quota Table (CQT) is where the DASD allocation statistics collected by the optional Quota Component are kept in real memory. It is the CQT that is updated as DASD activity takes place on a CPU. For multiple CPUs sharing DASD, each CPU has its own CQT. Information about the DASD activity on the other systems is passed via the DQT with the QSYNC process.

Disk Quota Table

The Disk Quota Table (DQT) is the online copy of the DASD allocation statistics collected by the optional Quota Feature. For multiple CPUs sharing DASD, there is one DQT. The DQT is updated via the QSYNC command

Quota Configuration File

The Quota Configuration File contains the general parameters that control the operation of the Quota Component. The online copy of the quota configuration file resides as member of the partitioned data set referenced in the PARMS DD statement in the JCL used to install the product into the operating system. The executable copy of it is compiled and loaded into real memory above the 16MB line. The quota configuration file is modifiable via the REFRESH command.

Optional Quota Component

Users who overuse their allocated disk space complicate storage Administration. These are most often developers and ad-hoc system users who do not have specific disk space needs and are allowed to allocate space from a shared disk pool. Since multiple users share the same pool, they must be good neighbors to assure everyone enough space.

Unfortunately, cooperation in sharing disk pools does not work reliably. Users still use more space than planned and deplete the shared pool. Then other users of the pool demand a solution from the Storage Administrator. With the introduction of SMS, running out of shared pool space grew more serious because SMS storage groups are much larger and many more users share the same pool.

The Quota Component resolves this disk-sharing problem by monitoring pool usage by user, group, or department and by giving Storage Administrators absolute control over how much total at any level can allocate. The Quota Component is intended for users and applications that require space monitoring.

How It Works

BrightStor CA-Allocate's operation system interfaces allow for the interception of data sets at several critical points during their life cycle:

- When they are initially allocated as "new."
- Later when they are accessed as "old."
- Every time they need to extend, whether this be on the same volume or a new one.
- Before any idle space is released from them.
- Before they are renamed.
- Even before they are deleted.

When intercepted, these data set allocation requests can be modified. What attributes can be modified varies, depending on the type of data set and the kind of allocation request. New data sets intercepted before their allocation requests complete have the most modifiable attributes, whereas old data sets intercepted before being renamed or scratched have the least. Detailed information on where it intercepts data set allocation requests and which data set attributes can be modified and when they can be found by reviewing the *User Guide*.

These intercept points are called "environments" with names descriptive of their function : ACS, ALLOC, DEFINE, SPACE, EXTEND, EOV, EOV_VSAM, OLD, RELEASE, RENAME, SCRATCH, QUOTA, QREBUILD, QSCAN.

ACS Environment

The ACS Environment is launched after each IBM DFSMS ACS Routine executes. DFSMS requires several ACS Routines. The ACS Environment provides a single point where the appropriate DFSMS Data Class, Management Class, Storage Class, and Storage Group can be associated with a new data set allocation. It can actually be used as a direct replacement for IBM ACS routines. Only the DFSMS Constructs themselves would need to be defined in the ISMF panels. The ACS Environment is where the decision is made on whether or not the data set is to be managed by DFSMS.

ALLOC Environment

The ALLOC Environment is launched for all new, non-VSAM data set allocations. This is where the attributes, such as primary and secondary space amounts, can be changed. And where, if the data set is non-SMS-managed, it can be redirected to a non-SMS storage group managed by BrightStor CA-Allocate.

DEFINE Environment

The DEFINE Environment is launched for all new VSAM data set allocations, with functions similar to those in the ALLOC Environment.

SPACE Environment

The SPACE Environment is launched for all new non-VSAM data set allocations after the target volume has been selected. This is where potential 'NOT CATLG 2' conditions can be detected and eliminated.

EXTEND Environment

The EXTEND Environment is launched for subsequent extent requests for most non-VSAM and VSAM data sets. This is where the size of the next extent can be either increased or decreased, depending on whether it's desired that the data set remain on the current volume or span onto a new one.

EOV and EOV_VSAM Environments

The EOV and EOV_VSAM Environments are launched, respectively, for every non-VSAM and VSAM potential out-of-space condition. This is where an additional volume can be dynamically added to the data set in order to prevent the otherwise x37 ABEND (non-VSAM) or non-zero step termination code (VSAM).

OLD Environment

The OLD Environment is conditionally launched for old non-VSAM data set allocations for potential unit mismatch conditions which, if left uncorrected, will result in the step terminating with an 'IEF210I UNIT FIELD SPECIFIES INCORRECT DEVICE NAME' JCL error.

RELEASE Environment

The RELEASE Environment is launched prior to idle space being released for a non-VSAM data set. BrightStor CA-Allocate can either permit or deny such requests.

RENAME Environment

The RENAME Environment is launched prior to a non-VSAM data set being renamed. BrightStor CA-Allocate can either permit or deny such requests.

SCRATCH Environment

The SCRATCH Environment is launched prior a non-VSAM data set getting deleted. BrightStor CA-Allocate can either permit or deny such requests.

QUOTA Environment

The QUOTA Environment is only applicable when running with the optional Quota Component. It is launched prior to any DADSM activity (CREATE, EXTEND, RELEASE, RENAME, SCRATCH) associated with non-VSAM and VSAM data sets. This is where space usage can be tracked on an application, or any other kind of a group, level. This is where a group can be limited to a maximum amount of allocated DASD space.

QREBUILD Environment

The QREBUILD Environment is used when the Quota Component is determining the current composition of allocated DASD space. It is launched during the QREBUILD function of the Started Task, something that should occur when the Quota Component is first installed, and then whenever DASD volumes are either restored or taken off-line. This is where the volumes whose DADSM activity is to be monitored by the optional Quota Feature are selected.

QSCAN Environment

The QSCAN Environments are used when the Quota Component is determining the current composition of allocated DASD space. It is launched for each data set residing on every volume selected in the QREBUILD Environment for quota tracking. This is where the space allocated by existing data sets is assigned to the appropriate Quota Group.

What's Next

All the functionality mentioned above is fully described in the *User Guide*. The next step is to familiarize yourself with this product and start installation. We advise new users to read the following chapters in the *User Guide* before getting started:

- Introduction
- Concepts and Facilities
- Implementation
- Operation

Reviewing these chapters prepares you for installing this product as described in the chapter "Installing" in the *User Guide*.

Chapter 3

Ask Your Buddy

Ask Your Buddy - Frequently Asked Questions

Q. What is the difference between VAM and BrightStor CA-Allocate?

A. VAM was the original name for SAMS:Allocate. SAMS:Allocate was subsequently renamed to BrightStor CA-Allocate DASD Space and Placement or BrightStor CA-Allocate for short.

Q. Why do I need a password to access StarTCC and eSupport?

A. The password keeps other people from being able to view your critical data on the read/write server. If you forget your password the administrator can reset it for you. You will be notified if the administrator clears your password. Failed attempts to access a user's data are logged at the server.

Q. Is BrightStor CA-Allocate compatible with SMS?

A. Yes, BrightStor CA-Allocate is compatible with all versions of DFSMS.

Q. What type of hardware is required, to run BrightStor CA-Allocate?

A. BrightStor CA-Allocate is not CPU dependent. Any CPU capable of running IBM MVS version 4.1 or higher is acceptable.